

State of California  
AIR RESOURCES BOARD

EXECUTIVE ORDER D-119-1  
Relating to Exemptions under Section 27156  
of the Vehicle Code

ECOTROLEUM, INC.

"AFR CONTROL VALVE"  
"SUPERIOR MILEAGE MAKER"

Pursuant to the authority vested in the Air Resources Board by Section 27156 of the Vehicle Code; and

Pursuant to the authority vested in the undersigned by Sections 39515 and 39516 of the Health and Safety Code and Executive Order G-45-5;

IT IS ORDERED AND RESOLVED: That the installation of the "AFR Control Valve" and the "Superior Mileage Maker" manufactured by Ecotroleum, Inc., of 25 South 300 East, Salt Lake City, UT 84111, has been found not to reduce the effectiveness of required motor vehicle pollution control devices and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for 1980 and older vehicles powered with carburetor equipped engines, 2500 cc or larger.

This Executive Order is valid provided that installation instructions for this device will not recommend tuning the vehicle to specifications different from those submitted by the device manufacturer.

Changes made to the design or operating conditions of the device, as exempted by the Air Resources Board, that adversely affect the performance of a vehicle's pollution control system shall invalidate this Executive Order.

Marketing of this device using an identification other than that shown in this Executive Order or marketing of this device for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board. Exemption of a kit shall not be construed as an exemption to sell, offer for sale, or advertise any component of a kit as an individual device.

This Executive Order does not constitute any opinion as to the effect that the use of this device may have on any warranty either expressed or implied by the vehicle manufacturer.

THIS EXECUTIVE ORDER DOES NOT CONSTITUTE A CERTIFICATION, ACCREDITATION, APPROVAL, OR ANY OTHER TYPE OF ENDORSEMENT BY THE AIR RESOURCES BOARD OF ANY CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF THE "AFR CONTROL VALVE" OR "SUPERIOR MILEAGE MAKER".

No claim of any kind, such as "Approved by Air Resources Board", may be made with respect to the action taken herein in any advertising or other oral or written communication.

Section 17500 of the Business and Professions Code makes untrue or misleading advertising unlawful, and Section 17534 makes violation punishable as a misdemeanor.

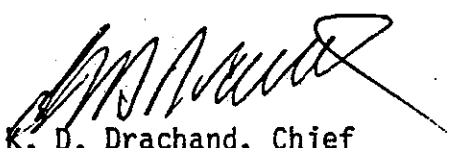
Section 43644 of the Health and Safety Code provides as follows:

"43644. (a) No person shall install, sell, offer for sale, or advertise or, except in an application to the state board for certification of a device, represent, any device as a motor vehicle pollution control device for use on any used motor vehicle unless that device has been certified by the state board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as a certified device which, in fact, is not a certified device. Any violation of this subdivision is a misdemeanor."

Any apparent violation of the conditions of this Executive Order will be submitted to the Attorney General of California for such action as he deems advisable.

Executive Order D-119, dated December 8, 1981, is superseded and of no further force and effect.

Executed at El Monte, California, this 20<sup>th</sup> day of May, 1983.

  
K. D. Drachand, Chief  
Mobile Source Control Division

STATE OF CALIFORNIA  
AIR RESOURCES BOARD

EVALUATION OF THE ECOTROLEUM "AFR CONTROL VALVE" AND THE "SUPERIOR MILEAGE  
MAKER" FOR EXEMPTION FROM THE PROHIBITIONS IN SECTION 27156 OF THE VEHICLE  
CODE IN ACCORDANCE WITH SECTION 2222, TITLE 13 OF THE CALIFORNIA  
ADMINISTRATIVE CODE

May, 1983

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EVALUATION OF THE ECOTROLEUM "AFR CONTROL VALVE" AND THE "SUPERIOR MILEAGE MAKER" FOR EXEMPTION FROM THE PROHIBITIONS IN SECTION 27156 OF THE VEHICLE CODE IN ACCORDANCE WITH SECTION 2222, TITLE 13 OF THE CALIFORNIA ADMINISTRATIVE CODE

by

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(This report has been reviewed by the staff of the California Air Resources Board and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Air Resources Board, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.)

## SUMMARY

Ecotroleum, Ltd. has requested that their "Superior Mileage Maker" valve be granted an exemption from the prohibitions in Section 27156 of the California Vehicle Code based on the data derived from a similar valve called the "AFR Control Valve" exempted by Executive Order D-119 dated December 8, 1981.

Based on the staff's evaluation of both valves, and previous laboratory data, exemption of the "Superior Mileage Maker" from the prohibitions in Vehicle Code Section 27156 is recommended.

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I. INTRODUCTION

Ecotroleum, Inc. of 25 South 300 East, Salt Lake City, UT 84111, has been granted an exemption for its "AFR Control Valve" from the prohibitions of Section 27156 of the Vehicle Code by Executive Order D-119 dated December 8, 1981. The applicant is requesting that a similar valve, called the "Superior Mileage Maker", be included under the same exemption.

II. SYSTEM DESCRIPTION AND FUNCTION

The AFR control valve consists of a mechanical switch, a thermal switch, and a solenoid with a ball check. The solenoid is installed in the line between the PCV valve and the engine air intake. The mechanical switch is attached to the throttle linkage, and the thermal switch is attached to the upper heater hose. When the temperature of the engine reaches normal operating condition and the engine speed is over 1500 RPM, the solenoid is energized, thus lifting the ball check and permitting a limited amount of atmospheric air to enter the PCV line. There is no air bleed at idle, low speed, or deceleration (Figure I).

The "Superior Mileage Maker" differs from the AFR control valve in the following aspects: The solenoid valve is replaced completely by a spring loaded mechanical valve. The mechanical switch with a curved slot is attached to the throttle linkage and controls the travel of the valve and, thus, the flow of air to the PCV line (Figure II).

### III. SYSTEM EVALUATION

The Air Resources Board evaluated the "AFR Control Valve" on two vehicles. The evaluation consisted of CVS-II cold start comparative emission tests.

A description of the vehicles and the test results are as follows:

1 - 1980 Buick Regal, 231 CID, 6 cylinder, inertia weight--3625 pounds, odometer--21,857, License No. 1BCZ046:

<u>CVS II</u>	<u>HC</u>	<u>Emissions--grams/mile</u> <u>CO</u>	<u>NOx</u>	<u>Fuel</u> <u>Economy</u> <u>MPG</u>
Baseline				
Test No. 1	0.38	7.18	0.92	--*
Test No. 2	0.33	6.69	0.99	19.0
AVERAGE	0.36	6.93	0.95	19.0
With Device				
Test No. 1	0.36	6.46	0.87	19.0
Test No. 2	0.38	6.15	0.98	19.0
AVERAGE	0.37	6.31	0.93	19.0

2 - 1975 Plymouth Fury, 360 CID, 8 cylinder, inertia weight--5000 pounds, odometer--58,065, License No. E836396:

<u>CVS II</u>	<u>HC</u>	<u>Emissions--grams/mile</u> <u>CO</u>	<u>NOx</u>	<u>Fuel</u> <u>Economy</u> <u>MPG</u>
Baseline				
Test No. 1	0.45	5.69	1.57	11.1
Test No. 2	0.38	- *	1.16	11.7
AVERAGE	0.42	5.69	1.36	11.4
With Device				
Test No. 1	0.42	5.78	1.22	11.7

\* Result Not Acceptable



The emissions test data show that the differences in emissions between the baseline and with device tests are within the test variability of the instruments, and, therefore, the use of the AFR control valve has little effect on the exhaust emissions and on the fuel mileage of the test vehicles.

The applicant submitted detailed information on the design of the "Superior Mileage Maker" for evaluation.

#### IV. STAFF EVALUATION

The basic difference between the two systems is the flow control valve. The "Superior Mileage Maker" uses a mechanical spring loaded valve to control the flow of air to the PCV line, instead of using a solenoid valve. The size of the inlet orifice of the two valves remains unchanged.

The staff is of the opinion that the solenoid valve opens completely when it receives the electrical signal; whereas, the mechanical valve opens gradually in following the movement of the curved slot of the switch. Therefore, under the same engine operating conditions, the "Superior Mileage Maker" will allow less air bleed into the PCV line than the AFR control valve. Since the "AFR Control Valve" did not increase emissions, the "Superior Mileage Maker" will not have any adverse effect on emissions either.

#### V. RECOMMENDATION

The staff recommends the adoption of Executive Order D-119-1, which exempts the "Superior Mileage Maker", in addition to the "AFR Control Valve", from the prohibition in VC 27156 for 1980 and older model vehicles with carburetor equipped engines, 2500 cc or greater.

FIGURE I

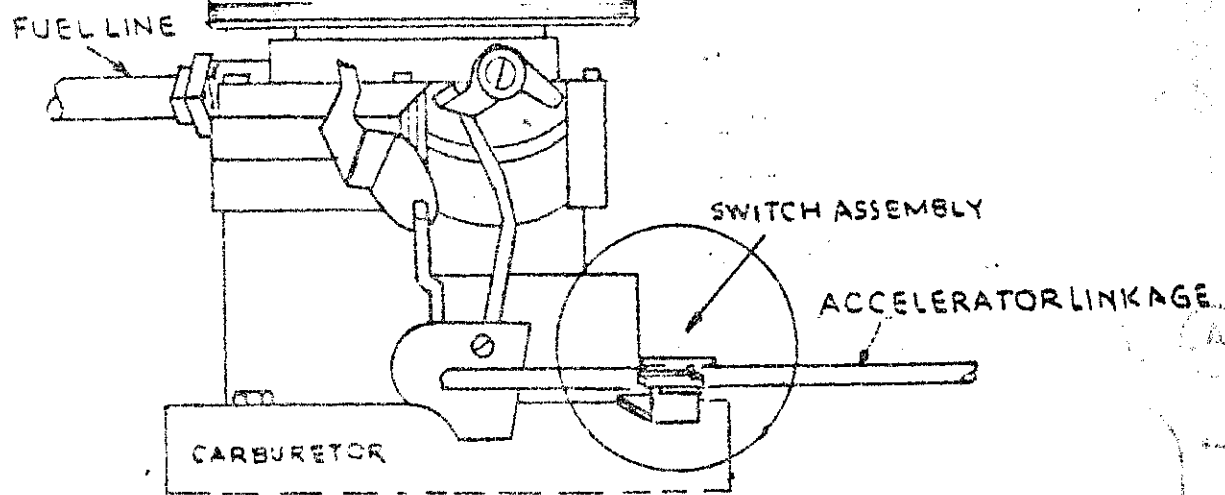


ILLUSTRATION # 2

ORIGINAL FILTER IS FACTORY INSTALLED

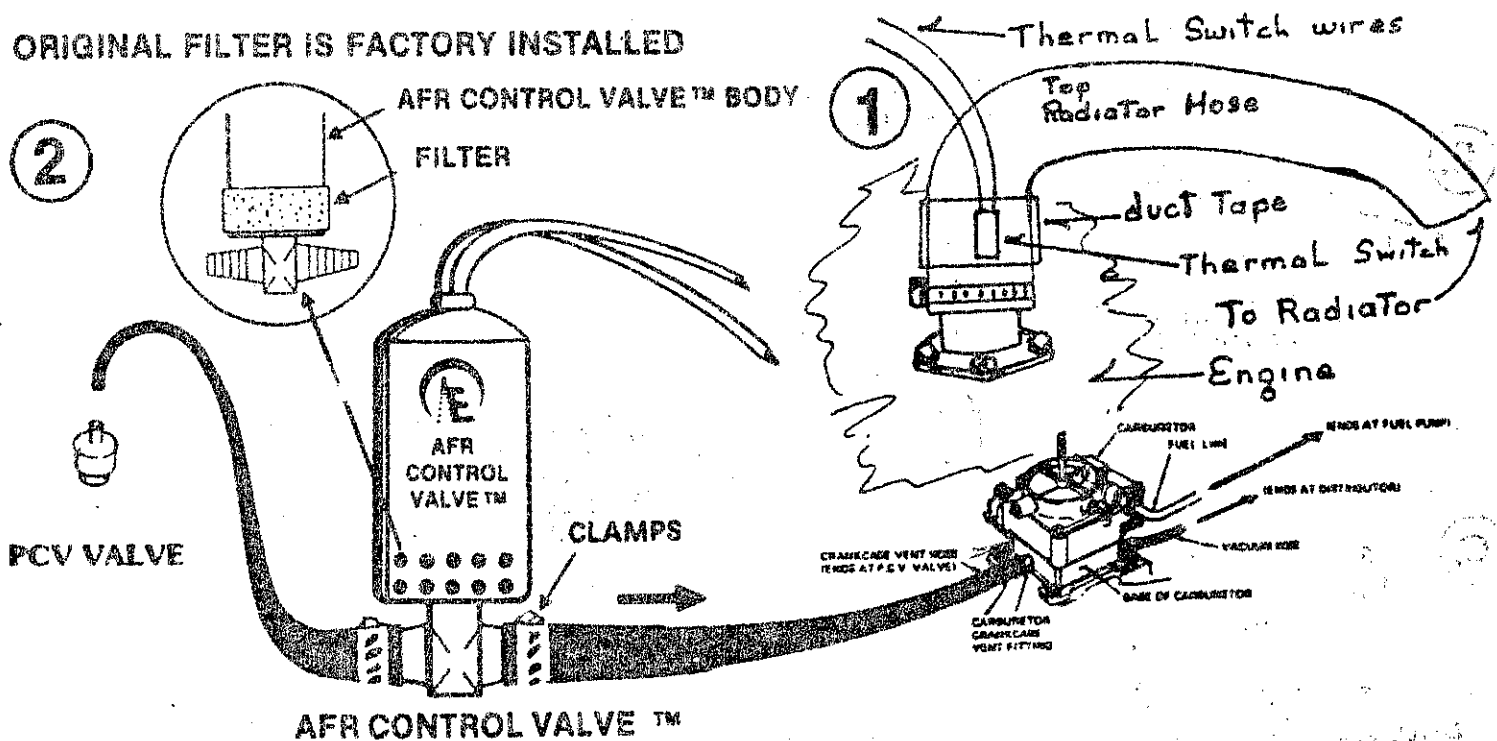


ILLUSTRATION # 3

Hook-up Diagram

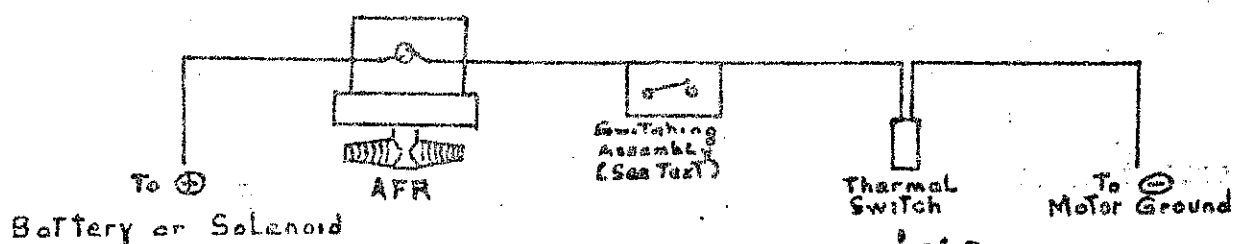


FIG. II

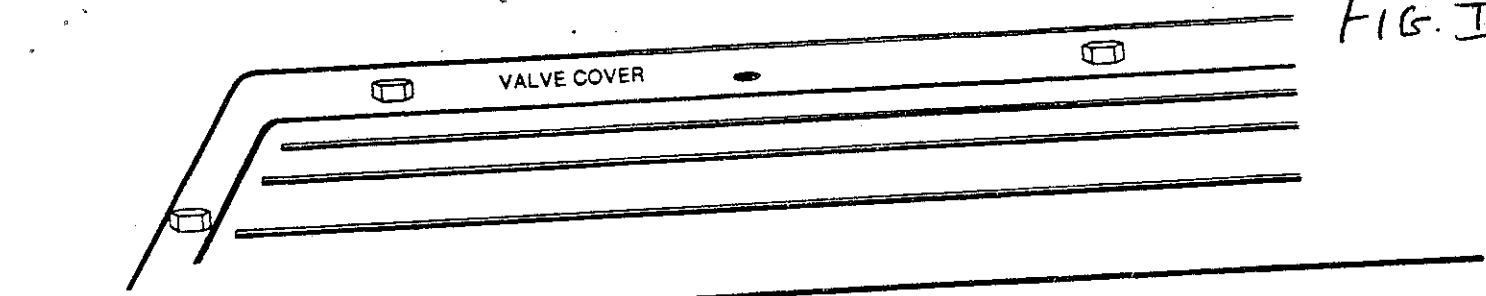


ILLUSTRATION #2

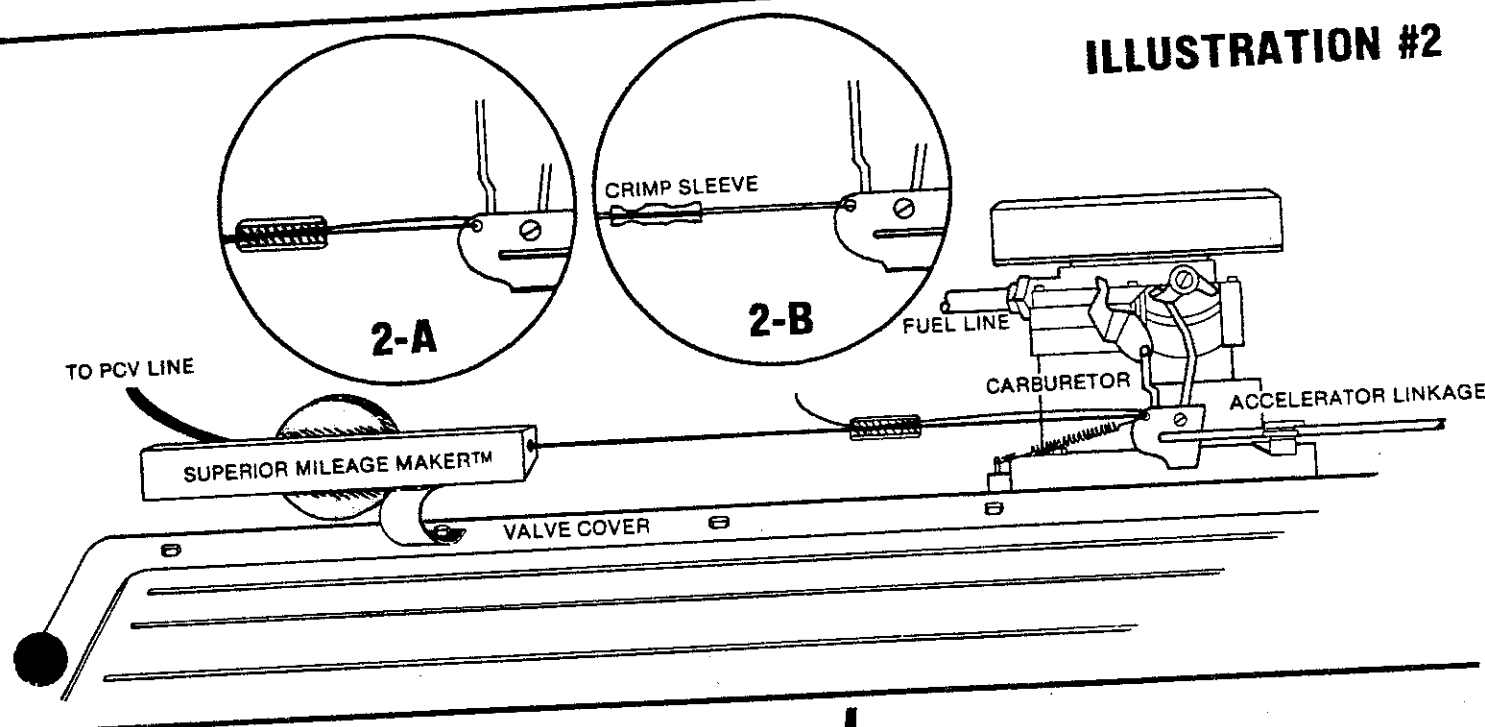
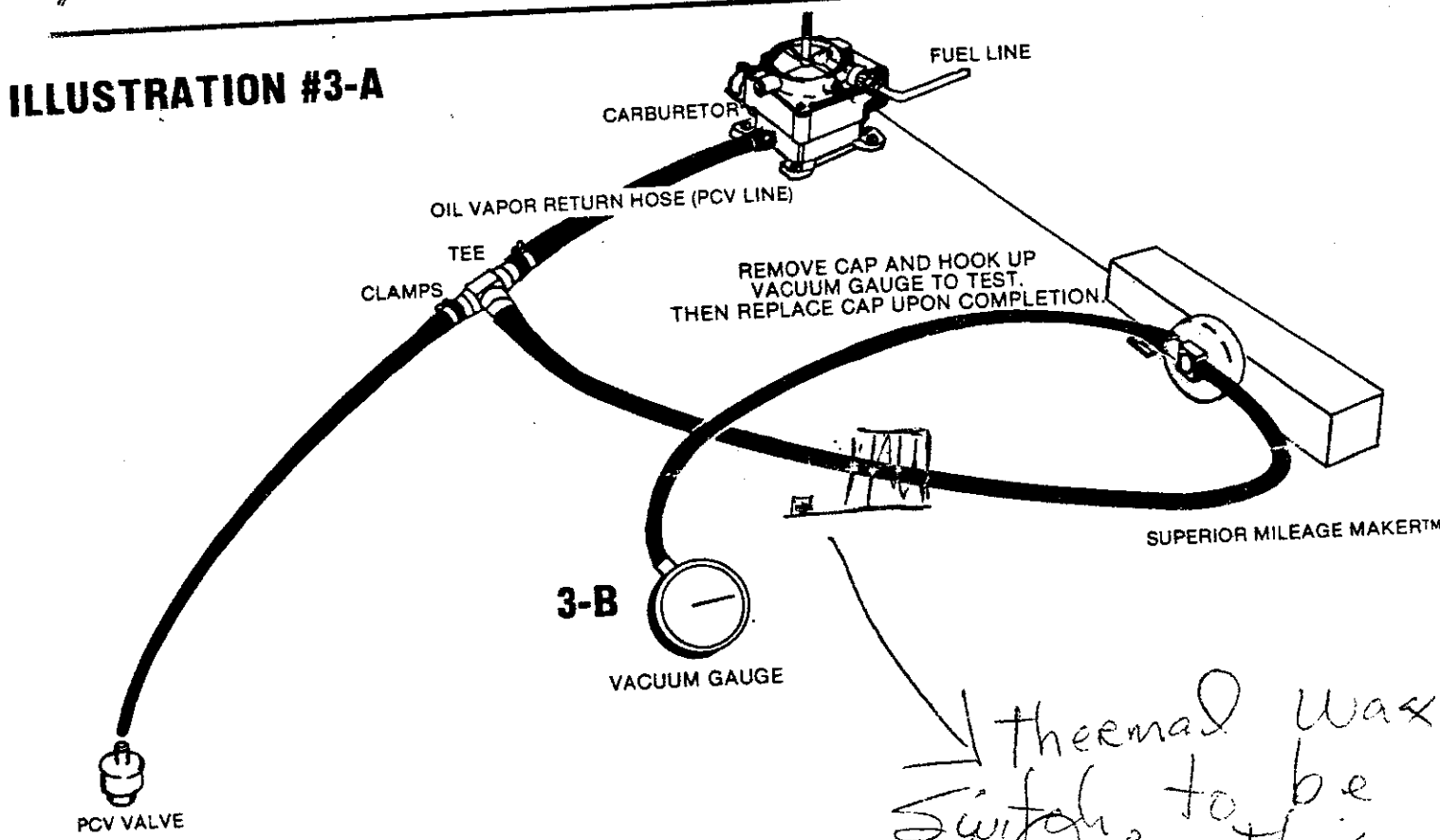


ILLUSTRATION #3-A



Thermal Wax Switch, to be inserted in this line for carb, only